31. An electric, electronic, optical or optoelectronic component or device having a coating comprising a soluble, film-forming conjugated poly(1,4-arylene vinylene) compound having a 1,4-phenylene vinylene unit with adjacent substitutents which produces blue-shifted electroluminescence or photoluminescence.

REMARKS

Claim 13 was said to be allowable if rewritten in independent form.

The remaining claims 1-7, 9, 11-12, 14-24 and 30-31 were rejected under 35 USC § 103 as being obvious over an Antoniadis, or Wan or Hsieh.

In response to applicants' prior argument that the product must be soluble (Response B), the examiner found this insufficient on the grounds that a characteristic in the preamble does not have patentable weight.

The examiner further found on the basis that the references disclose all the claimed requirements, then the "claimed soluble characteristic" must be considered "inherent" from the prior art.

Applicants have now amended claims 1 and 31 to eliminate any issue of whether or not a characteristic in the preamble can be given patentable weight (without necessarily conceding this as a legal issue). Applicants believe this should obviate the first objection.

As to the examiner's assumption that the claimed soluble characteristic must be considered inherent, applicants submit herewith two publications refuting the same.

As set forth in applicants' prior Response B, at page 3, the material disclosed in the cited references is understood by a person skilled in the art as being made by thermal conversion of a soluble precursor. This is contrary to the presently claimed invention where the compound must be soluble. As stated in Response B, this has the enormous advantage that the compounds according to the present invention can be processed in their final form rather than via a precursor polymer which requires thermal conversion.

Applicants submit herewith a copy of WO 92/16023, a PCT application published 17 September 1992 in the name of inventor Heeger and entitled "Visible Light-Emitting Diodes Fabricated From Soluble Semiconducting Polymers." This reference explicitly

states the disadvantages of the prior art deposition by precursor methods, as described in the cited references.

Beginning at page 2, line 16 and continuing to page 3, line 31, Heeger describes what is known to the skilled person concerning the prior art process of making LED structures in which a soluble precursor polymer is cast from solution onto the substrate, the precursor polymer is converted to the final conjugated PPV by heat treating the precursor polymer (already formed as a thin film on the substrate) to temperatures in excess of 200°C while pumping in vacuum. Heeger then explicitly states the specific disadvantages of this prior art process and structure. Specifically, he states that the need for heating to temperatures in excess of 200°C to convert the precursor polymer to the final conjugated polymer precludes the use of flexible transparent polymer substrates. Furthermore, the need for heating the temperature in excess of 200°C to convert the precursor polymer to the final conjugated polymer has the added disadvantage of possibly creating defects in the conjugated polymer and in particular at the outer surface of the conjugated polymer which forms the rectifying contact with the low work function metal. Heeger thus concludes that the ability to fabricate light-emitting diodes from organic materials, and in particulars from polymers, remains seriously limited.

The solution of Heeger is to provide light-emitting devices fabricated from semiconductor polymers which are soluble, thereby avoiding the need for subsequent heat treatment and elevated temperatures. This application was published in 1992, well in advance of any one of Antoniadis, Wan or Hsieh, and as such if the polymers disclosed in Antoniadis, Wan or Hsieh were soluble, they would not have been prepared by the precursor method. In fact, the skilled person would have known that it would have been disadvantageous to do so.

Also attached is a copy of an abstract from the Conference Proceedings held 21 August 2000 at the 220th ACS National Meeting in Washington, DC, by James Wilking et al. This publication explicitly refers to the insolubility of PPVs. It describes DP-PPV and its synthesis by chlorine precursor route. It is clear from this abstract that DP-PPV must still (at this time) be prepared by a precursor route because of its inherent insolubility.

Thus, these independent references support applicants' position that the cited references fail to teach or suggest applicants' claimed soluble film-forming conjugated poly(1,4-arylene vinylene) compound having a 1,4-phenylene vinylene unit with adjacent substituents, said substituents being oriented such as to affect the electronic structure of the compound sufficiently to cause a blue-shift in the photoluminescence and/or electroluminescence of the compound. Reconsideration and allowance of the present claims is respectfully requested.

If the examiner has any questions on the present submission, it is respectfully requested that he telephone the undersigned attorney to discuss any outstanding issues.

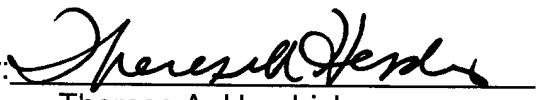
In view of the foregoing amendments and remarks, applicants respectfully request the reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: May 6, 2002

By: 

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Marked-Up Claims

1. A [soluble, film-forming conjugated poly(1,4-arylene vinylene)] compound comprising a soluble, film-forming conjugated poly(1,4-arylene vinylene) compound having a 1,4-phenylene vinylene unit [having] with adjacent substituents, said substituents being oriented such as to affect the electronic structure of the compound sufficiently to cause a blue-shift in the photoluminescence and/or electroluminescence of the compound.

31. An electric, electronic, optical or optoelectronic component or device having a coating [of] comprising a soluble, film-forming conjugated poly(1,4-arylene vinylene) compound [comprising] having a 1,4-phenylene vinylene unit [having] with adjacent substitutents which produces blue-shifted electroluminescence or photoluminescence.